

## **EXPANDABLE BARRICADE AND METHOD INHIBITING ACCESS**

### **CROSS REFERENCE TO RELATED APPLICATION**

**[0001]** This application claims priority to U.S. Provisional Application Serial No. 60/398,591 filed on July 26, 2002.

### **BACKGROUND OF THE INVENTION**

**[0002]** The present invention relates to barricades and, more particularly, to barricades that can serve multiple purposes.

**[0003]** Barricades are often used in different environments and for different applications. Examples of environments that use barricades include schools, streets, landscape work areas, and construction sites. Examples of applications include crowd control, guiding and directing traffic, and preventing access to dangerous or unauthorized areas.

**[0004]** Different types of barricades are often used for the different environments and applications. The barricades may serve different purposes based on, for example, their size and design. Thus, for example, a construction site may have three or four different types of barricades to address different needs.

**[0005]** There are problems associated with keeping multiple barricades of varying designs. For example, it can be expensive to have multiple types of barricades. Additionally, it can be difficult and time consuming to pull one specific type of barricade out of a general storage facility containing several types of barricades. Also, it can be cumbersome to transport the barricade, if it is large. Finally, barricades of different shapes and sizes may not be stored efficiently.

### **SUMMARY OF THE INVENTION**

**[0006]** An aspect of the present invention relates to a portable barricade comprising: a barricade frame, a first beam, and a first connector that connects the first beam to the barricade frame such that the first beam can be moved between a non-extended position and an extended position. The first beam extends horizontally outward from the barricade frame in the extended position.

**[0007]** An aspect of the present invention relates to a method of inhibiting access to a predetermined location. The method includes the step of providing a first portable barricade including a barricade frame, a first beam, and a first connector that connects the first beam to the barricade frame such that the first beam can be moved between a non-extended position

and an extended position. The first beam extends horizontally outward from the barricade frame in the extended position. The method also includes the step of moving the first beam to the extended position to inhibit access to the predetermined location.

[0008] It is to be understood that both the foregoing general description and the following detailed description are exemplary and explanatory only and are not restrictive of the invention, as claimed.

#### BRIEF DESCRIPTION OF THE DRAWINGS

[0009] The accompanying drawings, which are incorporated in and constitute a part of this specification, illustrate preferred embodiments of the invention and together with the description, serve to explain the principles of the invention.

[0010] Figure 1 is a perspective view of a first embodiment of a barricade according to the present invention;

[0011] Figure 2 is a front view of the barricade of Figure 1;

[0012] Figure 3 is a side view of the barricade of Figure 1 in an unfolded position;

[0013] Figure 4 is a top view of the barricade of Figure 1 in an unfolded position with one beam fully extended;

[0014] Figure 5 is a side view of the barricade of Figure 1 in a folded position;

[0015] Figure 6 is a front view of the barricade in Figure 1 with one beam fully extended;

[0016] Figure 7 is a front view of the barricade in Figure 1 with two beams fully extended;

[0017] Figure 8 is a front view of two barricades in Figure 1 placed end-to-end with two beams fully extended;

[0018] Figure 9 is a perspective view of the end of the beams in Figure 1 that are adapted to lock in place via a pin and socket configuration;

[0019] Figure 10 is a front view of the end of the beams in Figure 1 that are adapted to lock in place via a pin and socket configuration;

[0020] Figure 11 is a perspective view of a second preferred embodiment of a barricade according to the present invention;

[0021] Figure 12 is an end view of the barricade of Figure 11;

[0022] Figure 13 is a front view of the barricade of Figure 11;

[0023] Figure 14 is a front view of two barricades of Figure 11 placed end-to-end with two beams fully extended;

[0024] Figure 15A is a perspective view of a third embodiment of the present invention in which beams are stored vertically and then may be moved into an extended position by sliding them vertically in the barricade frame and then rotating them toward the horizontal;

[0025] Figure 15B is a perspective view of the embodiment shown in Figure 15A in which the beams have been rotated toward the horizontal;

[0026] Figure 15C is a perspective view of the embodiment shown in Figure 15A in which base members are in a closed position, thereby defining a handle;

[0027] Figure 16A is a perspective view of a fourth embodiment of the present invention in which removable beams are stored vertically and then may be removed by sliding them vertically through slots in a top portion of the barricade frame;

[0028] Figure 16B is a perspective view of the embodiment shown in Figure 16A in which the beams are horizontally inserted into slots formed in the side of the barricade frame, the beams remain in an extended position by being cantilevered;

[0029] Figure 17A is a perspective view of a fifth embodiment of the present invention in which beams are stored horizontally in a barricade frame and are movable into an extended position by being slid within horizontal tracks formed in the front and rear sides of the barricade frame;

[0030] Figure 17B is a perspective view of the embodiment shown in Figure 17A with the beams in an extended position;

[0031] Figure 18A is a perspective view of a sixth embodiment of the present in which beams are stored horizontally on top of the barricade frame and are movable into an extended position by being slid along the top surface of the barricade frame; and

[0032] Figure 18B is a perspective view of the embodiment shown in Figure 18A with the beams in an extended position.

#### DETAILED DESCRIPTION OF PREFERRED EMBODIMENTS

[0033] Reference will now be made in detail to presently preferred embodiments of the invention, which are illustrated in the accompanying drawings. An effort has been made to use the same reference numbers to refer to the same or like parts.

[0034] Figures 1 to 10 show a first embodiment of a multi-purpose folding barricade 10 according to the present invention. In this embodiment, the multi-purpose folding barricade 10 includes a barricade frame 30, at least one beam 40, and a connector that connects the beam 40 to the barricade frame 30 such that the beam 40 can be moved between a non-

extended position and an extended position. The beam 40 extends horizontally outward from the barricade frame in the extended position.

[0035] The barricade frame 30 is intended to support the beams 40 and preferably includes two support members 20. As shown in Figure 2, each support member 20 preferably has a substantially flat side panel 21 and two lower legs 22. The two lower legs 22 may be connected by a leg support 23, as shown. The side panel 21 may include a surface 28 that displays cautionary information such as, for example, a reflective surface, graphics images (e.g., universal slip-and-fall warning), verbal information (e.g., “CAUTION,” “CUIDADO,” “ACHTUNG,” etc.), or other customized material.

[0036] The support members 20 are preferably connected together at upper portions of the support members 20 such that the support members 20 can moved from a folded position (shown in Figure 5) to an unfolded position (shown in Figure 3) by moving lower portions of the support members 20 away from one another. The support members 20 can be attached together by a frame hinge 24, as shown in Figure 1. The frame hinge 24 can be a conventional hinge structure that preferably extends the length of the tops of the support members 20. Placing the support members 20 in the folded position facilitates storage and easier transport (hand carrying) of the barricade 10. When the support members 20 are in the unfolded position, from a side view they generally form the shape of an inverted “V.” Further, in the unfolded position, the support members 20 provide enhanced lateral stability. When the support members 20 are unfolded, the barricade frame 30 can be, for example, about 20” to about 28” wide and about 35” to about 45” tall. Preferably, the barricade frame 30 is about 24” wide and about 41” tall.

[0037] The support members 20 are preferably manufactured using a plastic injection molding process. Injection molding can make the barricade 10 light weight, durable (e.g., within reason, the barricade 10 can absorb an impact without denting), and rust resistant. Alternatively, it is also possible to form the support members 20 via a blow molding process that would permit at least portions of the support members 20 to be hollow. Blow molding of this nature would allow the support members 20 to be filled with sand or water to provide greater lateral stability which, in turn, would allow the barricade 10 to function better in inclement (e.g., windy) weather.

[0038] As can be seen in Figure 1, the barricade 10 is provided with at least one beam 40 which is provided between the support members 20 and which can be used to inhibit access

and/or to provide information. In addition, a side portion 42 of the beam 40 may include a surface that displays cautionary information such as, for example, a reflective surface, graphics images (e.g., universal slip-and-fall warning), verbal information (e.g., "CAUTION," "CUIDADO," "ACHTUNG," etc.), or other customized material to increase the visibility of the barricade 10. Placing the beam 40 in the extended position increases the span of the barricade 10 and, therefore, the area blocked by the barricade 10.

[0039] The multi-purpose folding barricade 10 can have, for example, one or two beams 40. Figure 6 shows the multi-purpose folding barricade 10 with one beam 40, which can be extended to provide a blocking distance X which is preferably about 50" to about 70" and more preferably about 60". Such a single beam 40 barricade could be used, for example, to block a narrow aisle, to prevent someone from walking over a spill, or to provide a graphic that directs a person in a direction around a spill. By way of contrast, Figure 7 shows the multi-purpose folding barricade 10 having two beams 40, which can be extended to provide a blocking distance Y which is preferably about 85" to about 105" and more preferably about 96". This dual beam 40 arrangement could be used, for example, to close a wide aisle, such as the aisle of a large hardware store, or to block access to an elevator.

[0040] Preferably, the barricade 10 is of the type shown in Figure 7, as it may be used in a manner similar to the embodiment shown in Figure 6. The beams 40 of this dual beam 40 embodiment are elongated members between about 30" and 40" long, and more preferably about 36" long. The beams 40 are preferably made via a blow molding process. Blow molding permits the beams 40 to be hollow throughout. This facilitates manufacturing of the pin 43 and socket 44 later described in detail.

[0041] As shown in Figures 1 and 2, the beams 40 may be rounded at the end 29 connected to the barricade frame 30. A shape of this nature may facilitate the motion of the beams 40 between extended and retracted positions, as shown in Figure 2.

[0042] As shown in Figures 2 to 4, the beam 40 is preferably attached to the barricade frame 30 by a connector, such as a beam pivot 41. The beam pivot 41 can be a conventional pivot structure. A conventional locking mechanism (not shown) can be formed on the beam pivot 41 to releasably lock and support the beam 40 in a cantilevered manner. Moreover, the locking mechanism can allow the beam 40 to be locked into an extended orientation, where it is approximately parallel to the ground, as shown in Figures 6 and 7, and extends substantially horizontally outward from the barricade frame 20.

[0043] As shown in Figure 5, the axis 41A of the beam pivot 41 is preferably positioned lower than the axes of rotation 24A of the frame hinge 24. By placing the frame hinge 24 as high as practicable, the support members 20 can be opened as far as practicable, thereby increasing the footprint of the frame 30 in the unfolded position to aid in the stability of the barricade. The added stability additionally enhances lateral support which reduces the likelihood that the barricade 10 will be knocked-down due to environmental conditions (e.g., wind). In addition, by placing the axis of rotation 41A of the beam pivot 41 as shown, the top side 31 of the beam 40, when in the extended orientation, will be substantially parallel to and generally in the same plane as the top side 27 of the frame 30, as shown in Figure 2.

[0044] After the beams 40 are in the extended position, it may be desirable to attach beams 40 of various barricades 10 end-to-end, as shown in Figure 8. As a result, several barricades 10 may be fixed together to form a longer barricade. This arrangement permits a large area, such as a road, to be barricaded. Joining the beams 40 together also increases the stability of a large barricade formed by several multi-purpose folding barricades 10. To facilitate the joining of the barricades 10, the beams 40 may include a mating device or connection mechanism which enables the beams of like barricades 10 to be joined.

[0045] For example, as shown in Figures 9 and 10, one beam 40 of a barricade 10 can be configured to have a mating device, such as a pin 43 projecting therefrom which has a height A and a diameter D. Correspondingly, another beam 40 of the barricade 10 can be configured to contain a mating device, such as a socket 44 formed therein which has a depth A' and a diameter D'. Preferably, the depth A' of the socket 44 will be the same as the height A of the pin 43 whereas the diameter D' of the socket 44 will preferably be slightly larger than the diameter D of the pin 43, to facilitate receiving the pin 43. Two like barricades 10 may be connected by inserting the pin 43 of one beam 40 of a first barricade 10 into the socket 44 of another beam 40 of another barricade 10.

[0046] Figures 11 to 14 show a second preferred embodiment of a multi-purpose folding barricade 110 according to the present invention. This second embodiment is similar to the first embodiment in some respects. In this second embodiment, however, the foldable barricade frame 30 of the first embodiment is replaced by an upright-standing barricade frame 50. As shown in Figure 13, the upright-standing barricade frame 50 preferably includes a vertical base member having substantially flat side panels 51 on each side (one of which is visible in Figure 13). The side panels 51 of the vertical base member may include a

surface 56 that displays cautionary information such as, for example, a reflective surface, graphics images (e.g., universal slip-and-fall warning), verbal information (e.g., "CAUTION," "CUIDADO," "ACHTUNG," etc.), or other customized material.

**[0047]** The vertical base member also may include two lower legs 52, which support the side panels 51, a center base member 53, and hinges 54 connecting the center base member 53 to two lateral base members 55. The hinges 54 permit the lateral base members 55 to move between an unfolded position (shown in Figure 11) to a folded position (shown in Figure 12). In the unfolded position, the lateral base members 55 provide lateral support to the frame 50, thereby decreasing the likelihood that the barricade 110 will be knocked-down by environmental conditions (e.g., wind). In the folded position, the lateral base members 55 rest against, or proximate to, the leg members 52, thereby reducing the footprint of the barricade 110. By reducing the footprint of the barricade 110, a greater number of barricades 110 may be stored (when not in use) in a given area.

**[0048]** As shown in Figure 13, the beams 40 are attached to the upright-standing barricade frame 50 via a connector, such as a beam pivot 11. The beam pivot 11 can be a conventional pivot structure. In addition, the beam pivot 11 may have a similar design to the beam pivot 41 of the first embodiment, i.e., each beam pivot 11 may have an axis of rotation 11A which enables a top edge 13 of the associated beam 40 to be substantially parallel to and generally in the same plane as the top side 14 of the upright-standing barricade frame 50 when the beam 40 is in the extended position. A locking mechanism can be provided to hold the beams 40 in a substantially horizontally extending position.

**[0049]** Figure 14 shows the embodiment of the multi-purpose folding barricade 10 shown in Figure 11 placed end-to-end with both beams 40 extended. It should be noted that in this embodiment, like the previously described embodiment, pins 43 and sockets 44, which may be formed on the beams 40 of the barricade 110, may be used to join a plurality barricades 110.

**[0050]** Figure 15A is a perspective view of a third embodiment of the present invention in which beams are stored vertically. In this embodiment, a barricade 210 is provided in which at least one beam 40 is stored vertically in a recess when in the non-extended position so that it is not substantially visible. When needed, the beams 40 may be raised vertically and then rotated toward the horizontal into an extended position. Similar to the previously described embodiments, the barricade 210 may have a side panel 221 which may include a surface 228

that displays cautionary information such as, for example, a reflective surface, graphics images (e.g., universal slip-and-fall warning), verbal information (e.g., "CAUTION," "CUIDADO," "ACHTUNG," etc.), or other customized material.

[0051] In the embodiment shown in Figures 15A-15C, two lateral base members 255 are hingedly attached to legs 222. When in an unfolded position (shown in Figure 15B), the base members 255 provide lateral support to the barricade 210. By way of contrast, when the base members 255 are in the folded position (shown in Figure 15C), they substantially reside within the footprint of the barricade 210, thereby facilitating storage of the barricade 210. Further, the base members 255 may be spring biased toward the closed position to facilitate carrying the barricade 210. In addition, above the folded base members 255, there may be provided a space 260 which may be used as a handle to aid in carrying the barricade 210.

[0052] Figure 16A is a perspective view of a fourth embodiment of a barricade 310 according to the present invention. Similar to the barricade 210 of the third embodiment, the beams 40 of the fourth embodiment are vertically stored in a recess, as shown. However, whereas in the third embodiment, the beams 40 were raised and rotated, in this barricade 310 embodiment, the beams 40 are raised out of the frame 350 of the barricade 310 via outlets 320. After the beams 40 are removed from the barricade 310, they can be pushed into slots 312 formed in the ends of the frame 350, as shown in Figure 16B. The beams 40 need only be inserted to a distance by which they will be supported in a cantilevered fashion. In one exemplary embodiment, the beams 40 may be inserted about 6" into the frame 350.

[0053] In the embodiment shown in Figures 16A and 16B, the frame 350 includes three base members 355 hingedly attached to legs 322. As shown, the barricade 310 may have one base member 356 on one side and two base members 355 on the other side. In this embodiment, the single base member 356 may rotate into a space between the legs 322. Similar to the third embodiment, when the single base member 356 is rotated into the space between the legs 322, a space (not shown) may be formed between the base member 356 and the side panel 321; this space may be used as a handle. Further, similar to the previously described embodiments, the barricade 310 may have a side panel 321 which may include a surface 328 that displays cautionary information such as, for example, a reflective surface, graphics images (e.g., universal slip-and-fall warning), verbal information (e.g., "CAUTION," "CUIDADO," "ACHTUNG," etc.), or other customized material.

[0054] Figures 17 and 18 respectively show related fifth and sixth barricade embodiments of the present invention, each of which will be discussed in turn. In the barricade 410 embodiment shown in Figures 17A and 17B, beams 40 are horizontally stored in the barricade frame 450. When needed, the beams 40 may be pulled out of the barricade frame 450 along tracks 442 into an extended position. Moreover, the beams 40 may be pulled out to any length, up to full extension. As a result, the span W of the barricade 410 is easily adjustable.

[0055] In this barricade embodiment, the barricade frame 450 includes two scissor base members 455 hingedly attached to legs 422. As shown, the scissor base members 455 open away from each other, thereby providing lateral support to the frame 450. Like the embodiment shown in Figures 15A-15C, both of the base members 455 of this barricade 410 embodiment may be rotated upward such that they reside within the footprint of the frame 450. In addition, this barricade 410 may also be provided with a permanent carrying space 460 or a space (not shown) between the folded base members 455 and a side panel 421. Moreover, the side panel 421 which may include a surface area 428 that displays cautionary information such as, for example, a reflective surface, graphics images (e.g., universal slip-and-fall warning), verbal information (e.g., "CAUTION," "CUIDADO," "ACHTUNG," etc.), or other customized material.

[0056] Similar to the embodiment shown in Figures 17A and 17B, the barricade 510 shown in Figures 18A and 18B also contains two beams 40 which are horizontally stored and which are horizontally pulled to an extended position. However, in this embodiment, the beams 40 have a substantially inverted "U" shape which wrap around the top of the side panel 521.

[0057] The various barricade embodiments can be used, for example, to inhibit access to a predetermined area, which may be a large area such as a construction site, a work zone, unauthorized area, etc. or a small area such as a hazardous area in a store aisle (e.g., broken glass, wet floor, spilled food, etc.) or outdoors (e.g., loose gravel, a hole in a sidewalk, uneven pavement, pothole, etc.). The barricades are designed to be carried by an employee and placed in the vicinity of the predetermined area. When in position, one or more beams of a barricade may be moved into an extended position to increase the span of the barricade, thereby decreasing the likelihood that an errant individual will fail to notice the barricade and inadvertently enter the predetermined region. In addition, in some embodiments, the beams of a plurality of like barricades may be joined to create a wider barricade.

[0058] The barricade embodiments described herein are advantageous because, among other things, they can be arranged in different configurations to serve a variety of needs. Thus, as one barricade may serve many needs, a user does not need to search through a storage location to find the desired type of barricade.

[0059] It should be readily understood that many aspects of the previously described embodiments are fully interchangeable. Accordingly, the barricade invention described herein includes all combination of the various beams, base members, connection mechanisms, handles, etc. described herein. Moreover, although every combination was not described herein, each combination is fully within the scope of the invention.

[0060] In addition, in any of the embodiments, a weight (e.g., a sand bag) may be placed over a portion of the barricade to reduce the likelihood that the barricade will be knocked-over. For the embodiments having two support members 20, the weight may be placed on the leg support 27. By way of contrast, for the upright-standing embodiments, such weights could be placed on top of the base members so as not to obscure the side panel having a cautionary image thereon.

[0061] Other embodiments of the invention will be apparent to those skilled in the art from consideration of the specification and practice of the invention disclosed herein. It is intended that the specification and examples be considered as exemplary only, with a true scope and spirit of the invention being indicated by the following claims.